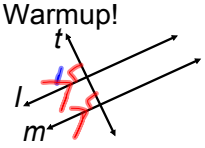
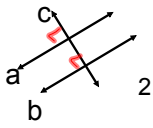
Warmup!



Given: l || m; $l \perp t$

1. Conclusion: $m \perp t$

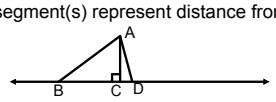


Given: $a \perp c; b \perp c$

2. Conclusion: $a \parallel b$

3. Which segment(s) represent distance from A to $\overline{CB}$?

$\overline{AC}$

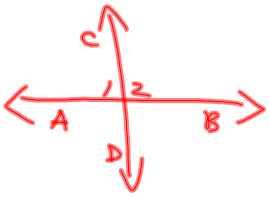


3.6 Prove Theorems about Perpendicular Lines

Notes

Several theorems about perpendicular lines

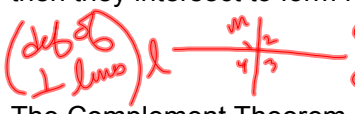
Theorem 3.8—If 2 lines intersect to form a linear pair of congruent angles, then the lines are perpendicular.



G: $\angle 1 \cong \angle 2$

Concl: $\overline{AB} \perp \overline{CD}$

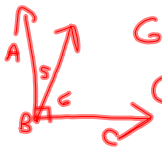
Theorem 3.9—If 2 lines are perpendicular, then they intersect to form four right angles.



G: $l \perp m$

Concl: $\angle 1, \angle 2, \angle 3, \angle 4$ are Right $\angle$s

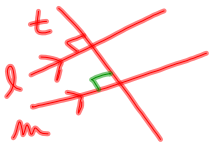
The Complement Theorem—If 2 sides of 2 adjacent acute angles are perpendicular, then the angles are complementary.



G: $\overline{BA} \perp \overline{BC}$

C: $\angle 5 + \angle 6$ are compl.

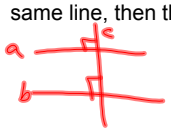
Theorem 3.11—Perpendicular Transversal Theorem—If a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other.



G: $l \parallel m$ $l \perp t$

Concl: $m \perp t$

Theorem 3.12—Lines Perpendicular to a Transversal Theorem—In a plane, if two lines are perpendicular to the same line, then they are parallel to each other.



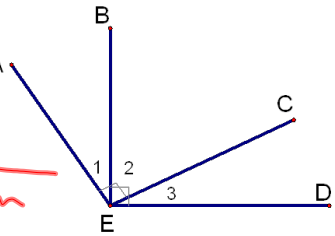
G: $a \perp c$ $b \perp c$

C: $a \parallel b$

Example:

Given: $\overline{AE} \perp \overline{EC}; \overline{BE} \perp \overline{ED}$

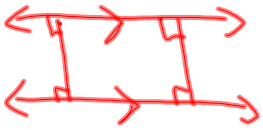
Prove: $\angle 1 \cong \angle 3$



Statements	Reasons
① $\overline{AE} \perp \overline{EC}$, $\overline{BE} \perp \overline{ED}$	① Given
② $\angle 1 + \angle 2$ are compl, $\angle 2 + \angle 3$ are compl	② The Compl. thm
③ $\angle 1 \cong \angle 3$	③ $\cong$ Compl. thm

Distance from a point to a line—the length of the perpendicular segment from the point to the line.

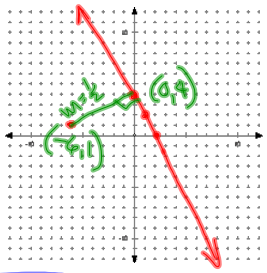
The distance between 2 parallel lines is the length of any perpendicular segment joining the 2 lines.



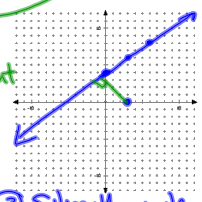
Examples:

Find the distance between the point and the line listed.

Ex 1: (-6,1) and y = -2x + 4

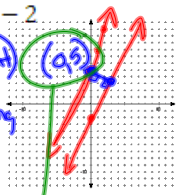


Ex 2: (3, 0) and $y = \frac{2}{3}x + 4$



Find the distance between the two parallel lines.

Ex 3: $y = 3x + 5$ and $y = 3x - 2$



Ex 4: $y = \frac{-1}{2}x$ and $y = \frac{-1}{2}x + 6$

Find the equation of the perpendicular bisector of the segment with the given endpoints.

Ex 5: (5, 2) (3, -6)

Ex 6: (-3, 7) (8, -5)

HW p194-195 #s 1-7, 13-17 last 3 from sheet
and find the distance between

$$y = -2x + 4$$
$$y = -2x - 5$$

Test Monday !

3.6 day 2 assignment

1. Find the distance between:
$y = -2x - 5$ $y = -2x + 4$

2. Find the distance between:
y = 1.5 x + 4 y = 1.5 x - 0.5

3. Parallelogram ABCD A(-4, -1) B(2, 3) C(7, 2) D(1, -2) Find the distance between the parallel sides.

4. Find the equation of the perpendicular bisector of $\overline{AB}$ A(0, 2) B (4, 7)